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(56) Documents Cited

US 4936418 A US 4909355 A US 4801005 A

US 4798754 A US 4497147 A US 3997073 A

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AU-8172351-A(BROOKFIELD)14.04.83(see abstract  
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(58) Field of Search

UK CL (Edition M ) F2A ALX

INT CL<sup>6</sup> F16N

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(54) Machine fluid collector

(57) An absorbent mat (80) is adapted for location beneath a vehicle or machine to catch oil which may drip down from the machine. The mat comprises an absorbent pad (102) enclosed within an envelop (101). Apertures (82, 83) are provided in the upper surface of the envelope to allow oil to fall directly onto the pad. Strengthening members (95, 96, 99, 100) are enclosed within the envelope and run along adjacent to the pad. The mat is flexible and may be rolled up into a more compact arrangement.

The pad may be of polypropylene. The mat may have flaps which can be positioned under the vehicle's wheels.

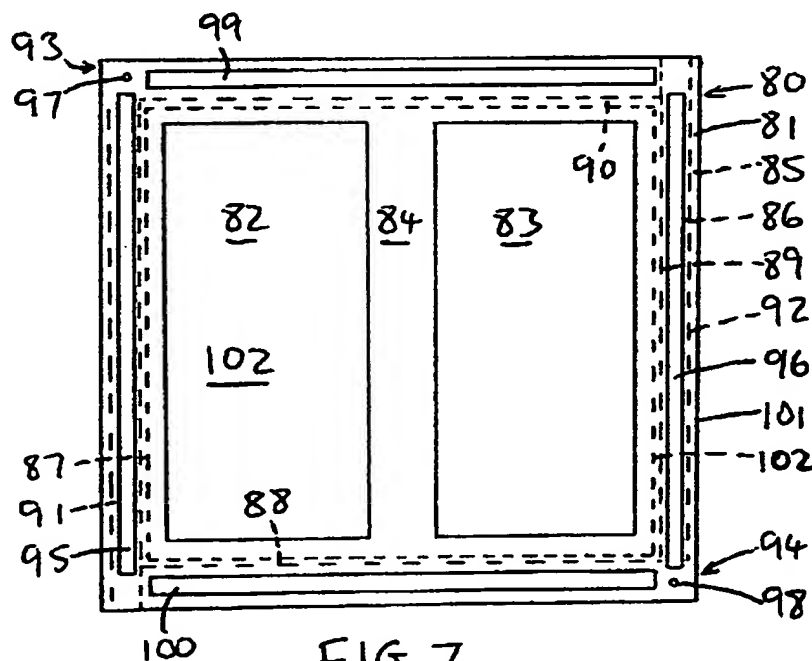


FIG. 7.

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

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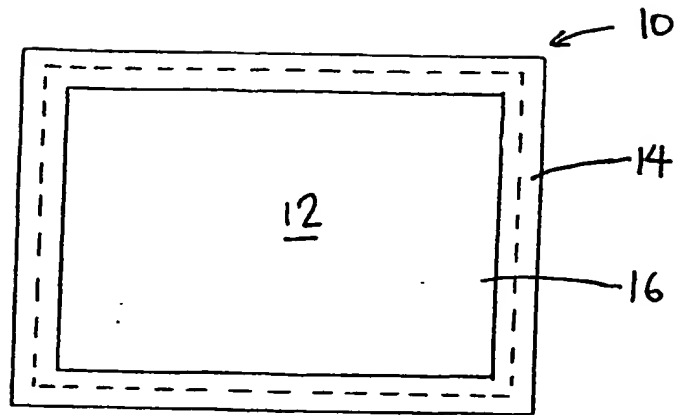


FIG. 1.

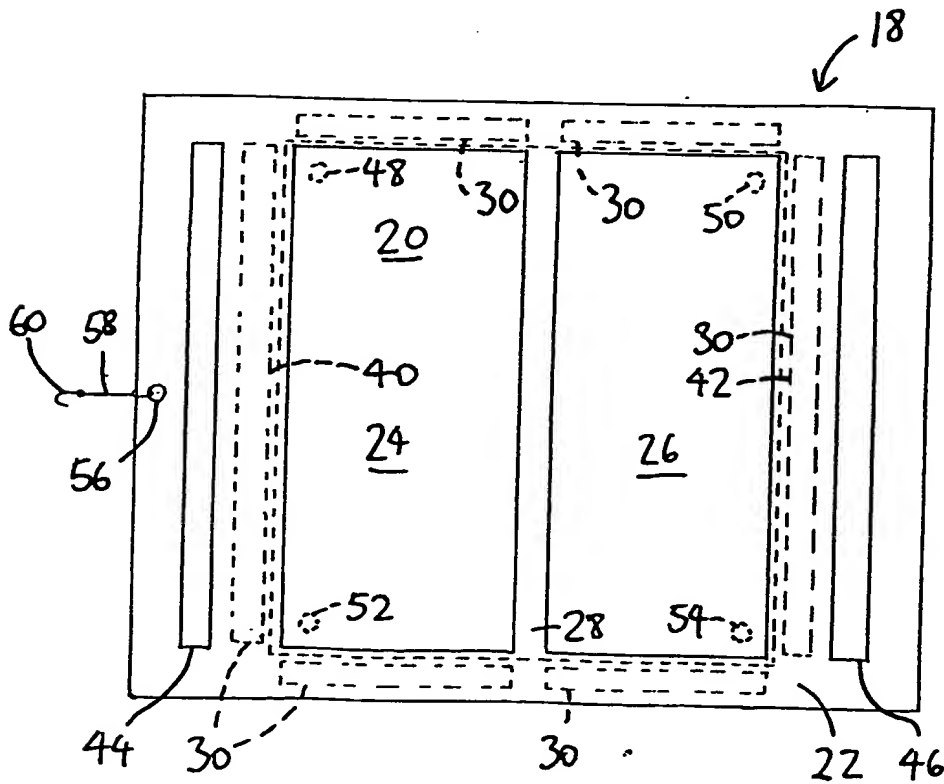


FIG. 2.

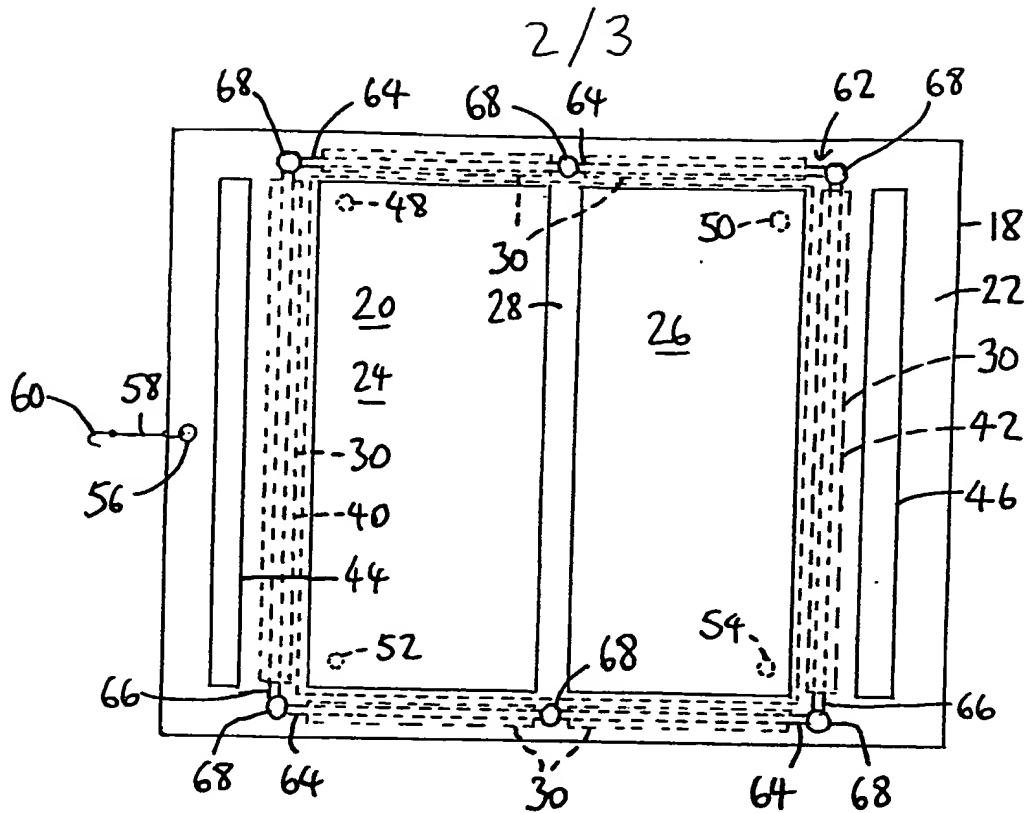


FIG. 3.

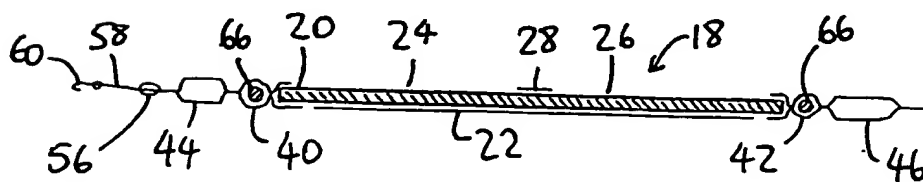


FIG. 4.

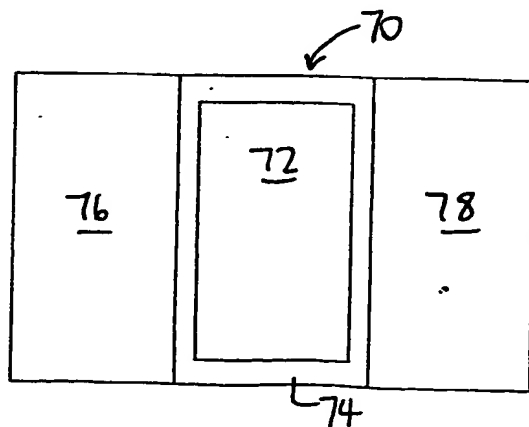
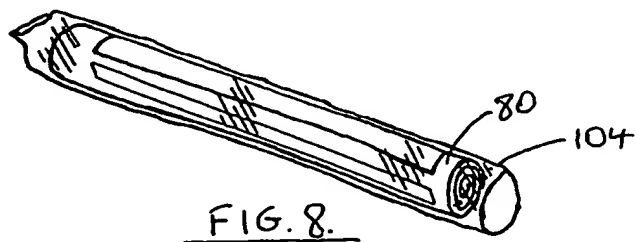
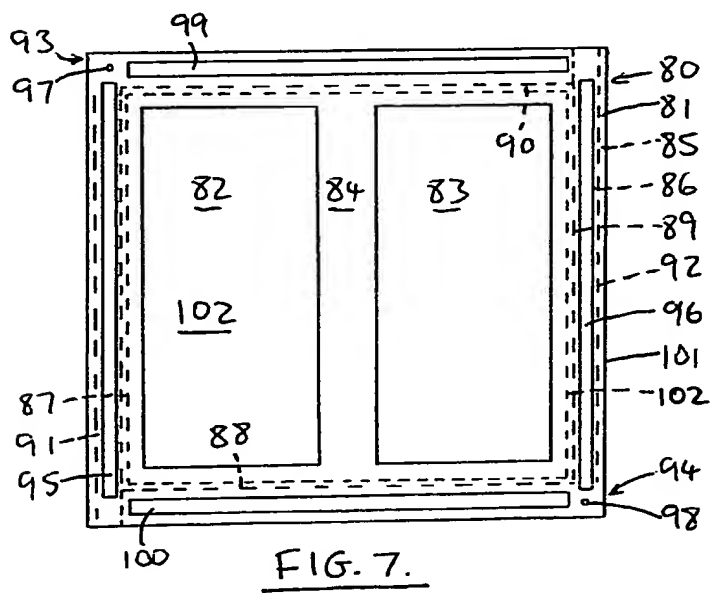
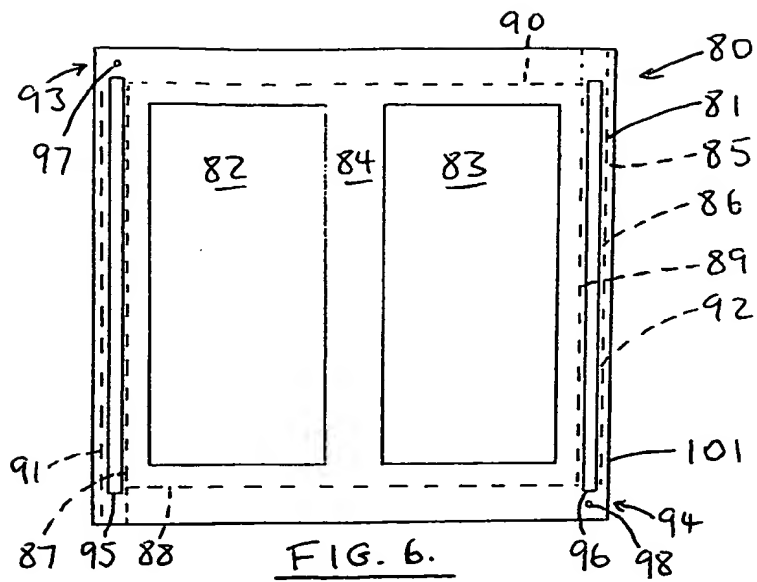


FIG. 5.

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MACHINE FLUID COLLECTOR

This invention relates to a collector for fluid which drips or otherwise escapes out of machinery. It is particularly concerned with a collector for oil which drips from engines of vehicles.

Engines, gearboxes, transmission systems, and other mechanical systems require lubricating fluids and other fluids in their operation. Consequent wear to seals and gaskets may allow fluids to leak out of engines and drip onto the surface on which the vehicle stands. This surface could be the floor of a workshop, a garage, a driveway or a public road.

The leakage of fluids can make the floor of a garage or other surface appear unsightly and a covering of such fluid can act as a trap for other kinds of dirt and contamination. The dirt or oil can be trod into the house which causes its own problems.

This soiling can necessitate cleaning of such surfaces which is difficult and time consuming. Furthermore, oil and other products on such a surface can make the surface very slippery and may contribute towards the occurrence of accidents.

It is known to scatter sand on such surfaces or to have shallow trays of metal or plastic to catch liquids dripping from beneath machinery. The storage of such trays is not easy particularly when they are soiled with oil and dirt.

It is an aim of the present invention to alleviate some or all of the problems mentioned in the foregoing.

According to a first aspect of the invention I provide a fluid collector for location beneath machinery in which the fluid collector is adapted to collect fluid which leaves the machinery.

The machinery may be a vehicle. However it could also be one of a wide variety of other machinery including a generator, metal working apparatus, winches or hydraulic apparatus.

Preferably the fluid is liquid. The fluid may be a lubricant, for example oil, or it may be coolant, hydraulic fluid, brake fluid or fuel. The fluid may drip or flow out of the machinery and then it may fall downwardly under the influence of gravity. The fluid may fall onto a surface on which the machinery stands.

The fluid collector may comprise a mat or a pad. The fluid collector may be absorbant or highly absorbant. It may be preferentially absorbant with respect to a particular type of liquid. It may preferentially absorb liquids containing organic substances over liquids containing inorganic liquids. It may have an affinity for oil. It may be hydrophobic.

The pad may comprise a sponge-like material. The pad may be made of a polymeric material, such as polypropylene. The pad may be flexible.

Envelope means may be provided to surround the pad. The envelope means may wholly or partially enclose the pad. The envelope means may be substantially impermeable to oil or other liquids into which the collector is likely to come into contact in use. The envelope means may be moulded of flexible plastics material. It may be integrally moulded.

The envelope means may be adapted to receive a frame means. Frame receiving means may be present on the envelope means.

Primary apertures may be provided in the envelope means to allow liquid or fluid to enter into direct contact with the pad. These primary apertures may be in the upper surface of the envelope means when the collector is in use.

Secondary apertures may be provided in the envelope means. These secondary apertures may allow water to drain through the collector. They may be provided in the ground-facing surface of the collector.

The frame means may give a greater degree of rigidity to the pad. The frame means and the pad may lie in a substantially common plane. The frame means may wholly surround the pad. Alternatively the frame means may overlies an edge region of the pad.

Preferably the frame means comprises a plurality of frame elements. The frame elements may be rod like or strip like in shape. Adjacent frame elements may be connected together by interconnection means. The interconnection means may comprise clip means.

Preferably the frame means comprises two substantially parallel frame elements provided to either side of the pad.

The frame means is adapted to be received in or removed from the envelope means. Preferably the frame means may be dismantled into smaller constituent parts before being removed from the envelope means. The



frame elements may be disconnected by release of interconnection means and the frame elements may be adapted to be removed individually from the envelope means.

Preferably, two frame elements are fixed in the envelope means and may not be removed therefrom. Two additional frame elements may be insertable into and removable from the envelope means. Alternatively the envelope means may have no removable frame means, or indeed may have no separate frame means.

Preferably adjacent frame elements, located in the envelope means are not connected together. The frame elements may flex freely with respect to each other with the constraints of being located within a common envelope means.

If elements of the frame means can flex in such a way the collector is less likely to be displaced by the wind. Unlike a rigid collector such as a tray it will flex rather than flip over. A portion of the collector may lift in response to the force of the wind (whilst another portion remains in contact with the ground) and then settle again.

The collector may have locating means for locating the collector in place. The locating means may be pocket means. The pocket means may be provided in the envelope means. There may be a plurality of pocket means. The pocket means may be adapted to contain water or another fluid, or may be adapted to hold solid objects. The pocket means may hold sand or the like as weighting means. The fluid or objects in the pocket means may act as weights.

Alternatively the pocket means and solid objects may be omitted altogether. The frame means may be sufficiently heavy to weigh down the collector.

The collector may be adapted to be folded or rolled-up. The frame means may be flexible enough to allow the collector containing the frame means to be folded or rolled-up and be more compact, for example to be stored more easily. Alternatively, the frame means, or part of the frame means, that is one or more frame elements, may need to be removed from the collector in order to allow the collector to be folded or rolled up. In another embodiment, the collector is adapted to be folded or rolled-up if only two, unconnected, substantially parallel frame elements are present.

The collector may be provided additional locating means. The locating means may be flap means. The flap means may comprise a sheet of material. The flap means may be attached to an edge region of the envelope or may be contiguous with the envelope. Flap means may be provided at two opposing sides of the collector. The flap means may be adapted to lie on the ground adjacent the collector and be securely held against the ground by wheels of a vehicle resting upon the flap means.

According to a second aspect of the invention we provide a method of protecting a surface from fluid which falls from machinery overlying the surface which comprises the steps of placing a fluid collector underneath the machinery and over the surface to be protected, the fluid collector collecting falling fluid.

This aspect of the invention may utilise a collector having some or all of the features of the foregoing.

According to a third aspect of the invention we provide a kit of parts for assembly into a fluid collector in accordance with the first aspect of the invention.

Preferably the kit includes a pad. The pad may be absorbant. Preferably the kit includes envelope means. Further and more specific particulars of the constituent parts of the collector may be comprehended with reference to the foregoing.

The pad is preferably replaceable with a new pad. The kit may have a number of spare pads. The kit may include a bag, into which the envelope means and/or pad can be stored in its rolled up condition. The bag may be a carrying bag and may have a handle.

The invention provides a fluid collector which is portable and which may be stored in a compact form.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings of which:-

Figure 1 shows a schematic representation of an oil collector according to the invention;

Figure 2 shows a plan view of an alternative embodiment of an oil collector;

Figure 3 shows a plan view of the oil collector of Figure 2 with a frame added;

Figure 4 shows a cross-sectional view of the oil collector along the line 4-4 of Figure 3;

Figure 5 shows a plan view of a further embodiment of an oil collector;

Figure 6 shows a plan view of a yet further embodiment of an oil collector;

Figure 7 shows a plan view of the embodiment of Figure 6 with a pad and frame members added; and

Figure 8 shows an oil collector stored in a bag.

Figure 1 shows a schematic representation of an oil collector 10. The oil collector 10 has the form of a material comprises a pad 12 enclosed within an envelope 14. The pad 12 is a hydrophobic oil absorbing material, for example a one layer or multi laminar structure of polypropylene. A suitable grade of polypropylene would be Drizit (Registered Trade Mark). A layer having a thickness of 3.5mm is appropriate for this application. The envelope 14 may be comprised of a suitable polymeric material being generally impermeable to liquids with which the oil collector is likely to come into contact (for example water). The polymeric material is approximately 30 microns thick. The other surface of the collector 10 is provided with an aperture 16 which presents the other surface of the part 12 to fluids, for example oil, which are likely to fall on to the collector.

Another collector 18 according to the invention is shown in more detail in Figure 2. A generally similar construction is maintained in which a pad 20 is

contained within an envelope 22, the envelope having an open upper surface to allow collectable fluids to fall directly onto the pad. The upper surface of the envelope is provided with two apertures 24, 26 which are separated by a dividing wall 28. In view of the large open area provided by the apertures 24, 26 in the upper surface of the collector 18, the dividing wall 28 is present to impart a degree of mechanical integrity to the envelope 22.

Surrounding the apertures 24, 26 and the dividing wall 28 is a sleeve system 30 which is adapted to contain a frame (not shown). Details of the frame locatable within the sleeve system of the collector 18 are given in relation to Figure 3. The sleeve system 30 comprises retention sleeves 32, 34, 36, 38, 40 and 42. The sleeves may be formed of hollow tubes, or flat strips, of material which are adhered or otherwise secured to the upper or lower face of the envelope 22. The sleeves are located at each end of and at the side of the apertures 24 and 26.

Adjacent to retention sleeves 40 and 42 are weight holding pockets 44 and 46 respectively. The pockets may hold weights, for example sand, other solid particulates, a monolithic piece of material, or a mass of liquid which add weight to the collector 18 and which resist displacement of the collector 18 by, for example, wind. If a volume of liquid, such as water, is used as a weight for the collector, the pockets 44, 46 may be partially filled to reduce the possibility of them bursting if run over by a vehicle.

Figure 3 shows the collector 18 of Figure 2 with a frame 62 installed in the sleeve system 30. Adjacent lateral frame elements 64 are connected together by

clips 68. A pair of lateral frame elements so connected is disposed above and below the apertures 24 and 26. The two pairs of lateral frame elements are connected by longitudinal frame elements 66 by means of clips 68. The longitudinal frame elements 66 may be wholly surrounded by, and held in, the envelope 14. They may not be removed from the envelope 14.

Although a pair of lateral frame elements may be comprised of one unitary element, it is preferred to have two smaller pieces which may be joined together. This allows the lateral frame elements to be separated and placed in storage pockets in the envelope (not shown) leaving the longitudinal frame elements 66 located in the envelope. In such an embodiment the collector may be rolled-up with the lateral frame elements (in pieces) stored in the envelope.

If the frame is sufficiently weighty, the weight may not be necessary, since the frame itself suffice to hold down the collector.

Figure 4 shows a cross-sectional view taken along line 4-4 of the collector 18 shown in Figure 3.

In use the collector 18 (in accordance with Figure 2) is unrolled and placed flat on a surface. The frame is assembled by inserting the frame elements 64, 66, into the sleeve system 30, and clipping the elements together with clips 68.

A collector 18 in accordance with Figures 3 and 4 is laid upon a surface over which a vehicle may park. If it is desired to install the collector 18 underneath a vehicle which is already parked over a surface, the collector 18 may be moved to a location beneath the

vehicle. A hook 60 is connected to an eyelet 56 in the envelope by means of a piece of rope or twine 58. It is possible to connect a further length of rope to the hook in order to drag the collector 18 to a position beneath the car. An additional purpose of the rope 58 and hook 60 is to allow for the collector to be packed away. If the lateral frame elements 64 are removed from the collector 18 (given an arrangement as shown in Figure 2) the collector 18 may be rolled up into a roll and the hook 60 wrapped around the rolled up collector 18 in order to hook onto the rope 58. For temporary storage the weights may be left in the collector. However, it is preferred not to have additional weights, but to use solely the weight of the frame to hold down the collector. The rolled-up collector 18 may be put into a bag for storage or transportation. Thus the collector is not likely to contaminate its surroundings and it may be placed in the back of a vehicle until the collector is needed.

Once located beneath a vehicle, the collector 18 may be exposed to the elements. It is possible for rain or water from other sources to be blown underneath the car and to land on the pad and be soaked by the collector 18. Even though the pad 20 is hydrophobic it is not desirable for the collector 18 to become saturated with water and accordingly drainage holes 48 50, 52 and 54 are provided in the bottom face of the collector 18.

A further embodiment of a collector is shown in Figure 5. The collector 70 has a conventional pad 72 retained within an envelope 74. Side flaps 76 and 78 are attached to either side of the envelope 74. The side flaps are comprised of sheets of material which may be positioned under a wheel of a vehicle in order

to hold the collector 70 down against the ground. This prevents the collector 70 being blown away or being stolen.

A final embodiment of an oil collector is shown in Figures 6, 7 and 8. This is the most preferred embodiment. The collector 80 of Figure 6 has an envelope 101 having an open upper sheet 81 to allow collectable fluids to fall onto a pad. The upper sheet 81 is provided with two apertures 82 and 83 which are separated by a dividing wall 84. The upper sheet 81 overlies and is attached to a lower sheet 85.

Surrounding the apertures 82 and 83 is a sleeve system 86. The sleeve system comprises a set of sleeves which are present to hold stiffening and weight providing members. The sleeves are formed by a number of heat sealed regions 87, 88, 89, 90, 91 and 92 joining together the upper and lower sheets. The upper and lower sheets are joined together all around their common peripheral region except at two locations which comprise frame insertion apertures 93 and 94.

Stiffening members 95 and 96 are sealed within the sleeve system and are not removable. The stiffening members may comprise galvanised steel strip.

Holes 97 and 98 punched through both upper and lower sheets 81 and 85, are present in two diametrically opposed corners of the collector 80.

Figure 7 shows the collector 80 with additional stiffening members 99 and 100 inserted in the sleeve system via the insertion apertures 93 and 94. The additional stiffening members are fed through the insertion apertures 93 and 94 until fully located in



the sleeve system, as shown in the Figure. Adjacent pairs of stiffening members 95 and 99, 96 and 99, 95 and 100 and 96 and 100 are not connected together and may flex relative to each other.

Once the additional stiffening members are in place, pins are inserted through the holes 97 and 98 to pin together the upper and lower sheets and thus prevent the additional stiffening members from falling out of the envelope 101.

A pad 102 is fed into the envelope through one of the apertures 82 and 83 and smoothed out until it is fully located and flat. The pad 102 is located in a pad location pocket bounded on four sides by the heat sealed regions 87, 88, 89 and 90.

Any of the collectors described in the foregoing may be supplied as a kit. In the case of the final embodiment described above, we may supply a collector 80 as shown in Figure 6, two additional stiffening members 99 and 100, two pads 102, two pins for insertion into the holes 97 and 98 and a set of instructions describing assembly and use. The collector 80 may be rolled up and enclose the members 99 and 100 pads 102, pins and instructions. The kit may be kept in a bag for storage or transportation.

A rolled up collector 80 stored in a bag 104 is shown in Figure 8.

In all of the embodiments disclosed in the foregoing the collector may be provided as a disposable unit or as a unit which is reusable. Once a significant amount of oil has been collected by a pad

in a collector, the pad may be removed from the envelope and washed in any suitable oil solvent, for example detergent in water. Once washed the pad may be dried out and replaced in the envelope. Alternatively a new pad may be inserted in the envelope and the old dirty pad may be discarded.

CLAIMS

1. A device for protecting a surface under an engine of a vehicle, the device being adapted to be placed on the ground underneath the vehicle engine and comprising a portable mat having a flexible body holding absorbent material which is adapted to absorb oil that falls on it.
2. A device according to claim 1 in which the absorbent material is a pad.
3. A device according to claim 1 or claim 2 in which the absorbent material is a polymeric material.
4. A device according to any preceding claim in which the absorbent material is made of polypropylene.
5. A device according to any preceding claim in which the body is made of a polymeric material.
6. A device according to any preceding claim in which the absorbent material is replaceable within the body.
7. A device according to any preceding claim which can be rolled up or folded for the purpose of transportation or storage.
8. A device according to any preceding claim in which the body is provided with stiffening means.
9. A device according to any preceding claim which is provided with weight means.

10. A device substantially as described herein with reference to one or more of the accompanying drawings.

11. A method of protecting a surface under an engine of a vehicle which comprises the steps of placing a portable mat on the ground underneath the vehicle engine, the portable mat having a flexible body which holds absorbent material, in which the absorbent material catches and absorbs oil which falls on to it.

12. A method according to claim 11 which comprises the additional step of inserting a pad of absorbent material into the flexible body.

13. A method according to claim 11 or claim 12 which comprises the additional steps of placing the mat on the ground and parking the vehicle above the mat.

14. A method substantially as described herein with reference to one or more of the accompanying drawings.

15. A kit for assembly into a portable mat for protecting a surface underneath the engine of a vehicle, the kit comprising a flexible body and an absorbent material adapted to be held within the flexible body.

16. A kit according to claim 15 in which the absorbent material is adapted to absorb oil that falls on to it.

17. A kit according to claim 15 or claim 16 in which the absorbent material is a pad.

18. A kit according to any of claims 15 to 17 in which the pad is of plastics polymeric material.

19. A kit according to any of claims 15 to 18 which comprises stiffening members.

20. A kit according to any of claim 15 to 19 which comprises weight means.

21. A kit substantially as described herein with reference to one or more of the accompanying drawings.

<b>Patents Act 1977</b> <b>Examiner's report to the Comptroller under Section 17</b> <b>(The Search report)</b>	<b>Application number</b> <b>GB 9412335.3</b>
<b>Relevant Technical Fields</b>  (i) UK Cl (Ed.M)      F2A (ALX) (ii) Int Cl (Ed.5)      F16N	<b>Search Examiner</b> <b>B B CASWELL</b>
<b>Databases (see below)</b> (i) UK Patent Office collections of GB, EP, WO and US patent specifications.  (ii) ONLINE DATABASES: WPI	<b>Date of completion of Search</b> <b>21 JULY 1994</b>  <b>Documents considered relevant following a search in respect of Claims :-</b> <b>1-21</b>

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<b>X:</b> Document indicating lack of novelty or of inventive step.	<b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.
<b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category.	<b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application.
<b>A:</b> Document indicating technological background and/or state of the art.	<b>&amp;:</b> Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	US 4936418 (CLAUSEN) see especially Figures 4-6	1, 2, 7, 15-17
X	US 4909355 (RAMOS) see whole document	1, 2, 5, 7, 8
X	US 4801005 (HAHN) see whole document	1, 2, 5, 7, 11, 13
X	US 4798754 (TOMEK) see whole document	1, 2, 5, 7, 8, 11, 13
X	US 4497147 (CLAPPER) see whole document	1, 2, 5-7, 11-13, 15-17
X	US 3997073 (MORRIS) see whole document	1, 2, 5, 6, 11-13, 15-17
X	WPI Abstract Accession No 83-51596K/22 and AU 8172351 A (BROOKFIELD) 14.04.83 (see abstract and WPI Abstract)	1, 2, 6-9, 11-13, 15-17, 19, 20

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